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spectral overlap

In the context of radiative energy transfer, the integral, $J = \int_0^\infty f'_{\mathrm{D}}(\sigma)\,\varepsilon_{\mathrm{A}}(\sigma)\mathrm{d}\sigma$, which measures the overlap of the emission spectrum of the excited donor, D, and the absorption spectrum of the ground state acceptor, A; f'_{D} is the measured normalized emission of D, $f'_{\mathrm{D}} = \frac{f_{\mathrm{D}}(\sigma)}{\int_0^\infty f_{\mathrm{D}}(\sigma)\mathrm{d}\sigma}$, $f_{\mathrm{D}}(\sigma)$ is the photon exitance of the donor at wavenumber σ, and $\varepsilon_{\mathrm{A}}(\sigma)$ is the decadic molar absorption coefficient of A at wavenumber σ. In the context of Förster excitation transfer, J is given by:

$$J = \int_0^\infty \frac{f'_{\mathrm{D}}(\sigma)\,\varepsilon_{\mathrm{A}}(\sigma)}{\sigma^4}\mathrm{d}\sigma$$

In the context of Dexter excitation transfer, J is given by:

$$J = \int_0^\infty f_{\mathrm{D}}(\sigma)\,\varepsilon_{\mathrm{A}}(\sigma)\mathrm{d}\sigma$$

In this case f_{D} and ε_{A}, the emission spectrum of donor and absorption spectrum of acceptor, respectively, are both normalized to unity, so that the rate constant for energy transfer, k_{ET}, is independent of the oscillator strength of both transitions (contrast to Förster mechanism).
See: energy transfer

Source:
PAC, 1996, *68*, 2223 *(Glossary of terms used in photochemistry (IUPAC Recommendations 1996))* on page 2275